

Application No. 09/753,197



REMARKS

The above-identified patent application has been reviewed in light of the Office Action dated September 23, 2002. In the amendments set forth above, Claims 7, 8 and 9 have been amended without abandoning or intending to dedicate to the public any patentable subject matter. Accordingly, Claims 7-12 are pending. For the reasons set forth below, the rejections of Claims 7-12 are respectfully traversed. Accordingly, reconsideration and withdrawal of the rejections of Claims 7-12 are respectfully requested.

Claim 9 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In the amendments set forth above, Claim 9 has been amended to state that the grain size of the channel is at least about 500 Å. In view of this amendment, it is submitted that the rejection of Claim 9 under 35 U.S.C. §112, second paragraph, should be reconsidered and withdrawn.

Claims 7-10 stand rejection under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,548,132 to Batra et al. ("Batra"). In order for a rejection under 35 U.S.C. §102 to be proper, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference. (MPEP §2131). In addition, Claims 11 and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Batra. In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103, there must be some suggestion or motivation to modify the reference, there must be a reasonable probability of success, and the reference must teach or suggest all of the claim limitations. (MPEP §2143). As described more fully below, Applicants submit that Batra does not teach, suggest or disclose a bottom gate thin film transistor in which the grain size of the source and the drain is greater than the grain size of the channel, and in which the gate is

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formed from a refractory metal. Therefore, the rejection of Claims 7-12 should be reconsidered and withdrawn.

The claimed invention is generally directed to thin film transistors (TFT). In particular, a TFT in accordance with the now pending claims has a bottom gate structure and includes a polycrystalline silicon film in which a channel, a drain and a source are defined. Furthermore, the grain sizes of the drain and the source are greater than a grain size of the channel. (See Independent Claims 7 and 8). In addition, as set forth in the amendments to Claim 7 and 8, the gate of a transistor as claimed is formed from a refractory metal.

Batra is generally directed to a thin film transistor with reduced leakage current. (Batra, col. 3, ll. 18-20). With respect to a bottom gated thin film transistor, Batra discusses a device that includes a TFT gate 54. (Batra, col. 5, l. 65 to col. 6, l. 1). However, Batra does not teach, suggest or disclose a gate formed from a refractory metal. Instead, with respect to a top-gated transistor, Batra discusses a gate 24 formed from a patterned layer of n+ doped polysilicon. (Batra, col. 4, ll. 54-58). With respect to a bottom-gated transistor, Batra simply describes an "overlying TFT gate 54 and adjacent insulating oxide regions 56." (Batra, col. 5, l. 67 to col. 6, l. 1). Therefore, for at least the reason that Batra does not teach, suggest or disclose a gate formed from a refractory metal, as variously recited by the claims, the rejections of the claims as anticipated by or obvious in view of Batra should be reconsidered and withdrawn.

Attached hereto is a marked up version of the changes made to the claims by the current amendment, captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

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It is submitted that the application is now in form for allowance. Therefore, early notification of same is respectfully requested. The Examiner is invited to contact the undersigned by telephone if doing so would expedite the resolution of this case.

Respectfully submitted,

SHERIDAN ROSS P.C.

By: 

Bradley M. Knepper
Registration No. 44,189
1560 Broadway, Suite 1200
Denver, Colorado 80202-5141
(303) 863-9700

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 7, 8 and 9 have been amended as follows:

7. (Twice Amended) A bottom gate thin film transistor comprising:

an active layer including a polycrystalline silicon film where a drain, a source and a channel are defined, grain sizes of the drain and source being greater than a grain size of the channel; and

5 a gate formed from a refractory metal.

8. (Twice Amended) A thin film transistor comprising:

an insulator substrate;

a refractory metal gate electrode located on the insulator substrate;

an insulator film provided on the insulator substrate and the gate electrode; and

5 a polycrystalline silicon film located on the insulator film, a channel defined in a first portion of the polycrystalline silicon film over the gate electrode, a drain and a source defined in second and third portions of the polycrystalline silicon film over the insulator substrate, grain sizes of the drain and source being greater than a grain size of the channel.

9. (Twice Amended) The thin film transistor according to claim 8, wherein the grain size of the channel is at least about 500 Å [set large enough] to provide a desired on current of the thin film transistor.

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